

65. (NEW) The process of claim 64 wherein said drying period is between 2 minutes and 5 minutes.

66. (NEW) The process of claim 64 wherein subjecting said article surface to pulses of air atomizes water droplets on said article surface.

67. (NEW) The process of claim 64 wherein one pulse of air is generated for a square centimeter of said article surface.

REMARKS

The Examiner rejected claims 1, 2, 4, 5, 7-9, 21-24 and 26-28 under 35 U.S.C. §103(a) as being obvious over Moysan (United States Patent No. 5,413,874) in view of European Patent Application No. 0,486,711. Moysan discloses an article including a nickel layer 13 disposed on a substrate 12 by electroplating. A layer of nickel-tungsten-boron alloy 20 is disposed in the nickel layer 13. A layer of a non-precious refractory metal 22 is disposed on the layer 20 by physical vapor deposition. Moysan does not disclose the step of subjecting the article having the electroplated nickel layer 13 to pulses of air to dry and clean the electroplated article. European Patent '711 discloses an apparatus for blowing off a liquid from an article by pulsating compressed air jets on the article. The Examiner contends that it would be obvious to employ pulsating air jets as suggested by EP '711 in Moysan.

There is no suggestion in Moysan to employ pulsating air jets to clean the electroplated article. Moysan does not disclose any step of cleaning or drying. Nothing in Moysan discloses or suggests employing pulses of air to dry and clean an electroplated article surface. Applicant's claims are not obvious, and Applicant respectfully requests that the rejection be withdrawn.

Additionally, subjecting an electroplated surface with pulses of air to dry and clean the electroplated surface as required by Applicant's claims provides additional benefits and advantages over the prior art. As disclosed in Applicant's specification on pages 1 and 2, coating a vapor deposited layer on an electroplated layer is known in the prior art. As the vapor deposited layer is thin, a drawback of the prior art is that any water spots or surface defects caused by the electroplating process show through the thin vapor deposited layer. To avoid this,

the prior art has employed cleaning the electroplated articles with a water based cleaning system and using nitrogen drying to dry the articles. A drawback is that this is expensive and not always successful. Alternately, the article is hand dried and cleaned, which is laborious. Subjecting an electroplated article surface with pulses of air to dry and clean the electroplated surface eliminates the problems of the prior art and solves the problems of the prior art. Applicant's claims are not obvious.

Claims 29-32 stand rejected under 35 U.S.C. §103(a) as being obvious over Moysan '874 in view of EP '711 and further in view of Moysan (United States Patent No. 5,626,972). Moysan '972 discloses an article having nickel layers 14 and 16. A nickel-tungsten-boron-alloy layer 20 is disposed over the nickel layer 16, and a chrome layer 21 is disposed over the nickel-tungsten-boron alloy layer 20. In Moysan '972, the nickel-tungsten-boron alloy layer 20 is disposed between the nickel layer 16 and the chrome layer 21. Applicant's claims 29-32 require that a chrome layer is electroplated directly on the electroplated nickel layer. If Moysan '972 was truly combined with the combination of Moysan '874 and EP '711, the combination would not suggest directly electroplating a layer of chrome directly on an electroplated layer of nickel as required by Applicant's claims. Claims 29-32 are not obvious.

Claim 10 is rejected under 35 U.S.C. §103(a) as being obvious over Moysan '874 in view of EP '711 and further in view of Pudem (United States Patent No. 5,558,759). Claims 11-13, 18 and 20, which depend on claim 10, stand rejected under 35 U.S.C. §103(a) as being obvious over Moysan '874 in view of EP '711 further in view of Pudem and further in view of Moysan '972. As disclosed in column 10 of Pudem, Pudem discloses a finishing process for a base metal substrate. The process includes the steps of striking a component with copper to form a copper plate, electroplating the component with nickel, electroplating the component with brass, and then dipping the component in a chromate bath. In Pudem, the component is electroplated with brass between the application of the copper layer and the chrome layer. In Applicant's claims 10, 11-13, 18 and 20, the chrome layer is electroplated directly on the copper layer. The combination of Pudem with Moysan '874 and EP '711 does not suggest a chrome layer directly electroplated to a copper layer as required by Applicant's claims, and the claims are not obvious.

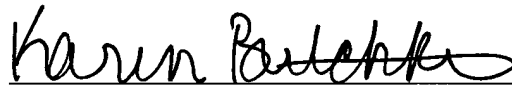
Claims 14-17, 19 and 33-36 stand rejected under 35 USC §103(a) as being obvious over Moysan '874 in view of EP '711, Pudem, Moysan '972 and further in view of Welty (United

States Patent No. 5,922,478). Welty discloses a sandwich coating. The Examiner contends that it would be obvious to employ a sandwich coating in view of Welty. The claims require alternating layers of zirconium or zirconium-titanium alloy and zirconium nitride or zirconium-titanium alloy nitride. Welty discloses a sandwich layer 26 having alternating layers of a refractory metal or refractory metal alloy 30 and a refractory metal compound or refractory metal alloy compound 28. However, Welty does not disclose that the sandwich layer includes alternating layers of zirconium nitride or zirconium-titanium alloy nitride as required by Applicant's claims. The combination of these references do not disclose or suggest a sandwich layer having alternating layers of zirconium or zirconium-titanium alloy and zirconium nitride or zirconium-titanium alloy nitride, and Applicant's claims are not obvious.

Thus, claims 1, 2, 4, 5, 7-24, 26-36 and 64-67 are in condition for allowance. Enclosed is a check for \$72.00 for four additional dependent claims. No additional fees are seen to be required. If any additional fees are due, however, the Commissioner is authorized to charge Deposit Account No. 50-1482, in the name of Carlson, Gaskey & Olds, P.C., for any additional fees or credit the account for any overpayment. Therefore, favorable reconsideration and allowance of this application is respectfully requested.

Respectfully Submitted,

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CERTIFICATE OF MAIL

I hereby certify that the enclosed Response is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to Assistant Commissioner of Patents, Washington D.C. 20231 on this 17th day of January 2003.


Tracey Belanger

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MARKED UP VERSION SHOWING CHANGES MADE

10. (THRICE AMENDED) The process of claim 1 wherein said electroplating comprises electroplating at least one layer comprised of copper on said at least a portion of the surface of said article to provide at least one electroplated copper layer, electroplating at least one layer comprised of nickel on said at least one electroplated copper layer to provide at least one electroplated nickel layer, and electroplating at least one layer comprised of chrome directly on said at least one electroplated nickel layer.

29. (THRICE AMENDED) The process of claim 1 wherein said electroplating comprises electroplating at least one layer comprised of nickel on at least said portion of the surface of said article to provide at least one electroplated nickel layer, and electroplating at least one layer comprised of chrome directly on said at least one electroplated nickel layer to provide at least one electroplated chrome layer.